

Accurate feeding of a dry bulk material is often critical to maintaining product quality. Thermo Scientific volumetric and loss-in-weight feeders maintain quality and weighing accuracy, reduce material waste and improve blend consistency for increased profits.

Thermo Scientific Volumetric and Loss-In-Weight Feeders

Accurate Feeding of Dry Bulk Materials



Applications

- Apple (frozen)
- Arabic gum
- Blueberry (frozen)
- Cereal
- Cocoa
- Coffee
- Enzymes
- Flour
- Hydrated lime
- Milk in powder
- Silica
- Soybean
- Spinach (powder)
- Sugar
- Vanilla extract
- Vanillin
- Water

If your product is not listed please send us a sample; we will be glad to test it with our feeders and let you know which model is the best for your need.

Thermo Scientific Standard Modular Volumetric Feeder

Volumetric feeders are utilized in bulk material feeding applications when the feed rate and total weight measurements are not necessary and accuracy requirements of $\pm 1-2\%$ are permissible. Volumetric adjustments are accomplished through the use of an open loop variable speed control, which can be operated either locally or remotely.

The Thermo Scientific standard modular volumetric feeder is available in four sizes and provides accurate feeding up to 11000 dm³/h (388 ft³/h). The unit's design affords the ability of handling a broad range of bulk solid materials with various characteristics and may be equipped with an integral, free-flowing hopper, or an optional dust containment trough cover for use directly beneath a bulk material storage bin.

The modular design of the volumetric feeder permits selection of the most economical design required for a specific application with the unparalleled ability to upgrade the design as materials and characteristics change.

Various system options may be added to allow the unit to adapt to a broad range of feeding applications and materials.

- A standard feeder with static hopper, trough and feed screw for free-flowing materials.
- An agitator conditioner feeder with a secondary trough conditioning screw for semi-flowing materials.
- A vibrated feeder using controlled vibration for non-free-flowing materials.

Thermo Scientific Ramsey Low Capacity Volumetric Feeder

This low capacity volumetric feeder is available in four different models depending on the product and application. With easy free-flowing product, the various systems are capable of the following maximum rates:

- Model LIW90D – maximum rate 90 dm³/h (3.18 ft³/h)
- Model LIW900D – maximum rate 900 dm³/h (31.78 ft³/h)
- Model LIW3000D – maximum rate 3000 dm³/h (105.94 ft³/h)
- Model LIW11000D – maximum rate 11000 dm³/h (388.46 ft³/h)

The unit's design addresses the issues associated with accurate, low-volume feeding, such as bridging, material build-up and stagnation. Its simple design, rugged construction and compact size make it readily adaptable to existing process lines. All gaskets are in food-grade material (U.S. FDA approved) and, where necessary, a stainless steel core is used for radial bracing. Single lip and double lip gaskets (up to 15 bar) are used. Motor transmission used for extraction screws and rack breaker device is controlled by a transmission chain and two independent gear reducer boxes. This allows one speed for the breaker device and one for the extraction screws avoiding problem of material build up and power consumption. Shafts of the screws are fixed on both sides in order to avoid oscillation. Seal of the screws is ensured with the bellows seals, the threaded solid box and the self-lubricant, FDA-approved radial bearings.

Thermo Scientific Ramsey Loss-In-Weight Feeder

The continuous loss-in-weight principle involves weighing the entire feeding system (hopper, feeder, and bulk material) by means of a static-type scale system, and controlling the discharge feed rate of the bulk material by means of a variable speed motor.

Material is discharged from the system, via screw or vibratory tube or tray, with the measured "loss in weight" per unit time (dv/dt) compared to the desired (set) feed rate. The difference between the actual (measured) rate and the desired (set) rate produce a corrective action by the feed rate controller, the Thermo Scientific Ramsey Micro-Tech 3104 or 2104, which automatically adjusts the feeder speed, thus maintaining accurate feed rates with no process lag.

When the measured weight in the hopper reaches the hopper low (refill) level, the controller affixes the feed system into volumetric control. The hopper is then quickly recharged (manually or automatically), and the loss-in-weight control action repeats.

In a batch loss-in-weight system, the design is similar to a continuous loss-in-weight system. However, the accuracy of the final weight at the end of the feed (batch) cycle is typically more critical than the actual feed rate control.

The Ramsey™ Micro-Tech 3104 or 2104 controller accomplishes this by providing a high feed rate signal to the variable speed drive for quick filling and then switching to a low feed rate control signal for precise, fine control at the end of the batch.



Thermo Scientific Ramsey Loss-In-Weight Feeder

Thermo Scientific Ramsey Micro-Tech 3104 or 2104 Loss-In-Weight Feeder Controller

These controllers are specifically designed for continuous or batch loss-in-weight or gain-in-weight applications. The Ramsey Micro-Tech 2104 provides easy operation and calibration with large easy-to-read displays, straight forward, tactile-touch keyboards and software that prompts you step-by-step through the proper set-up and operational procedures.



Thermo Scientific Ramsey Micro-Tech 3104



Thermo Scientific Ramsey Micro-Tech 2104

Ramsey Micro-Tech 3104 and 2104 Advantages

- Capable of operating two independent loss-in-weight systems.
- Common operator interface for setup and calibration reduces operator training.
- Digital electronics provide accurate, drift-free performance.
- Auto-Zero automatically computes and installs a new zero.
- Auto-Span automatically computes and installs a new span based on electronic calibration, static weights or material load.
- Numerous programmable features let the user customize the electronics to fit individual needs.
- Communication and fieldbus capabilities include Siemens Profibus-DP, Allen Bradley® RIO and Modbus.
- Multi-level password protection provides varying levels of security for operator access.
- LEDs provide visual indication of control status: Remote control, Automatic control, Alarm, Batch, and Ready.
- Refill capabilities include automatically adjusting the volumetric constants according to the net weight. Therefore, if the density of the material is significantly different between a high level hopper and a low level hopper, affecting the flow rate, the controller will automatically adjust the output at the end of the refill cycle.
- Batch capabilities allow the user to control flow rate and required quantity, and switch to a lower rate set point for a fine batching end.
- Available in UL approved version

Features & Benefits

- Low capacity and sanitary versions available
- Double screw design, well-suited for a variety of applications
- Handles hot, floodable and difficult materials
- Unaffected by dust and material accumulation
- All parts in touch with the products' stainless steel AISI304 construction (optional AISI316)
- Rack breaker device to maintain a constant density and a regular and constant flow
- Variety of helix and screw sizes available to meet a broad range of applications
- Parts are easily accessible and detachable for cleaning and maintenance
- Particular design (patent number 1544138) reduces contact between material and gaskets (both screws and vertical agitator); this increases working life of bearings and gaskets (especially with abrasive materials) and prevents infiltration (and consequently stagnation and contamination) of product in the bearing itself.
- Loss-in-weight system capable of $\pm 0.5\%$ accuracy

Available Options

- Vibrator on hopper/feeder trough
- Agitator conditioner feeder with secondary trough conditioning screw
- Hopper cover with inlet opening and vent
- Flushed seals
- Versions available with ratings to meet hazardous/dangerous area applications



Service

When you invest in Thermo Scientific products, you're also buying our commitment to service. Our pledge is to work with you, the customer, to continuously apply new technology and offer real solutions to your specific needs. We will work with you to answer your application requirement and service questions, to service your equipment, and to support and assist you every step of the way. No matter what your location, no matter what your need, you can count on Thermo Fisher Scientific service representatives. Our service and fast, parts turnaround time are just two of the attributes that set us apart from other vendors.

Thermo Scientific Volumetric and Loss-In-Weight Feeders

Standard Volumetric Feeder Specifications

Product Containment Trough

Surface Material	AISI 304 stainless steel (316 SS available as option)
Product Contact Surface Treatment	Mirror polish finish
External Surface Finish	Micro-shot blasting

Product Contact Gaskets

Material	Food-grade white rubber, hardness 45ShA
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Material Extraction System

Type	Double screws
Dimensions	Defined according to product characteristics and rate
Pitch	Defined according to product characteristics and rate

Feeder Reduction Gear

Type	Screw without aim with adapter
Lubrication	Synthetic oil CLP 680

Motorization Support Parts

Surface Material	Aluminum 6082 – UNI 9006/4
Treatment	Natural grey anodized

Nuts and Bolts

Material	AISI 304 stainless steel
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Ratings

Optional version approved for installation in hazardous areas Class II, Division 1 & 2, Groups E, F & G; and dangerous areas Zone 2 / Zone 22 according to ATEX 1999/92/CE and 94/9/CE

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